(figs. 9–11) five sixths as long as the dentes, lanceolate from the side, linear from above, serrate with entire apex. Head and body naked, excepting a few stiff anal setae; appendages sparsely clothed with minute stiff setae. Maximum length, 0.56 mm.

Described from twenty-one types, some of which have been given to the Museum of Comparative Zoölogy at Cambridge, Mass.

EXPLANATION OF PLATE II.

Neelus murinus.

Fig. 1. Left aspect of left hind leg, × 118.

Fig. 2. Diagram of a sagittal section showing the peculiar alimentary canal of the genus, × 118.

Neelus minutus, n. sp.

Fig. 3. Lateral aspect, × 122.

Fig. 4. Lateral view of left antenna, × 506.

Fig. 5. Right aspect of right fore foot, × 1008.

Fig. 6. Right aspect of right hind foot, × 1008.

Fig. 7. Ventral tube as seen from the left side, × 269.

Fig. 8. Ventral tube showing exsertile papillae, × 448.

Fig. 9. Furcula. × 269.

Fig. 10. Furcula, from above, × 224.

Fig. 11. Right aspect of left mucro, × 605.

MICRODON LARVAE IN PSEUDOMYRMA NESTS.*

BY WILLIAM MORTON WHEELER, AUSTIN, TEXAS.

The larvae of the Syrphid flies belonging to the genus Microdon are of peculiar interest to the entomologist both on account of their occurrence in ant nests and because of their remarkable appearance which is more like that of slugs, planarians or scale-insects than Dipteron larvae. In Europe they have long been known to occur in the nests of several Formicidae and even in the nests of Vespa crabro.†

Wasmann‡ records the occurrence of the larva and pupa of *Microdon mutabilis* L. with *Formica fusca*, *F. rufa*, *F. rufibarbis*, *Lasius niger*, *L. brunneus and L. flavus*, and of *Microdon devius L.* with *F. fusca*, *F. sanguinea*, *F. rufa and L. fuliginosus*. Adlerz§ found a species in the nest of *Camponotus herculeanus*. In the United States Microdon larvae are occasionally found with *Camponotus pennsylvanicus* and *Formica integra*, and a care-

* Contributions from the Zoological Laboratory of the University of Texas, No. 20.

† Wasmann. Vergleichende Studien ueber Ameisen gaeste und Termitengaeste Tijdschr. voor Entomol. Bd. 33, 1890.

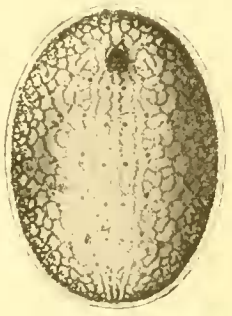
‡ Kritiches Verzeichniss der myrmekophilen und termitophilen Arthropoden. Berlin 1894 pp. 173 and 175.

§ Myrmecologisker Notiser. Entomol. Tidskrift 1896 pp. 131–132.)

ful examination of the literature would probably show that they have also been taken in the nests of other species of Formicidae in this country. Of their occurrence in the tropics, however, little is known. Wasmann (loc. cit.) mentions the larva of one species as occurring in Madagascar with *Camponotus Hildebrandti*, and the larva and pupa of another as having been found in ant nests in Australia. He also records the occurrence of these larvae in termite nests in Madagascar and Porto Alegre, Southern Brazil.

During the Christmas holidays, while collecting ants at Cuernavaca, Mexico, I happened on some Microdon larvae in the nests of *Pseudomyrma gracilis* Fabr. var. *mexicana* Emery, one of the numerous varieties of a tropical ant which seems to be of rather common occurrence from the extreme southwest corner of Texas (about Brownsville according to Townsend,*) to Rio Grande do Sul in Southern Brazil (v. Ihering.†) In one of the Pseudomyrma nests which was in a hollow acacia limb and contained a deälated queen, about a dozen workers and a lot of larvae and pupae, a mature Microdon larva was found attached to the wall of the chamber in the midst of the ants. The other Pseudomyrma nest was in one of the epiphytic Tillandsias.‡ This contained a Microdon puparium from which the fly had already escaped. The anterior third of the pupa-case had been pushed off in the manner characteristic of the Cyclorhapha.

The occurrence of such bulky and defenceless Dipteron larvae in the nests of large-eyed, active ants like the Pseudomyrmas, which are, moreover, provided with powerful stings, is nearly as surprising as their occurrence in the nests of Vespa. Apparently the relations between the larvae and their hosts are the same as those of other species of Microdon larvae to the less formidable ants of Europe and the United States. Adlerz (loc. cit.), who was able to make some observations in Sweden, came to the conclusion that the Microdon larvae subsist on the moist and tender wood, forming the walls of the ant galleries in pine stumps although they were also found in burrows in the dry bark. The ants seemed not to pay the slightest attention to the Dipteron larvae living in their midst. Wasmann § also found that the



Adult larva of Microdon sp., living in nests of *Pseudomyrma gracilis* Fabr. var *mexicana* Em. × 5.

*On the Biogeography of Mexico and the South Western United States II. Trans. Tex. Acad. Sci. 1897. Vol. II No. 1, p. 72.

†Die Ameisen von Rio Grande do Sul. Berlin. Entomol. Zeitschr. Bd. 39. Hett. 3 1894 p. 383.

‡For a description of these singular nests the reader may be referred to my article on "Compound and Mixed Nests of American Ants," Am. Naturalist 1901.

§ Erster Nachtrag zu den Ameisengaesten von Hollaendisch Limburg. Thjdcshr. voor Entomol. Deel 49 1898 p. 7.

larvae of *Microdon mutabilis* were completely ignored by the ants in a mixed colony of *Formica sanguinea-fusca*. But he observed that the fly, which is covered with delicate yellow pile, was assiduously licked by *F. sanguinea* although it soon died. Except for this last observation, which relates only to its imaginal stage, Microdon may be regarded as belonging to Wasmann's category of synoeketic myrmecophiles, or indifferently tolerated guests, a great company which also comprises the tiny crickets of the genus Myrmecophila.*

The imagines of a number of species of Microdon have been described from North America but they all appear to be rare insects. They fly reluctantly and are fond of lurking about the roots of grasses and other plants in situations where they readily elude the observation of the most careful collector. I am unable to conjecture to which of the described Mexican species the larva observed in the Pseudomyrma nests belongs. The accompanying photograph will enable any future observer to identify it without much difficulty, even if it should be found, as I have no doubt it will be, in the nests of other species of ants in Mexico and Central America.

NOTES ON THE MATING OF *ATTACUS CECROPIA* AND OTHERS.

BY CAROLINE G. SOULE, BROOKLINE, MASS.

In most of the large collections of *cecropia* cocoons which I have examined the female pupae have outnumbered the male by about five to one, twice by three to one. For this reason I have inferred that the males were polygamous, and this spring I have tested them, as the moths emerged very early.

Close observation has convinced me that the female *cecropia* requires sixteen hours out of the cocoon before she is ready to mate. In no instance did a female protrude the whole ovipositor sooner, and in no instance did the male in the cage with her attempt mating or seem in the least attracted or excited before the protrusion of the whole ovipositor. Partial protrusion occurs earlier.

I feel convinced that there is a different odor diffused when the whole ovipositor is protruded, in the case of all the large Saturniids, and often I think I can detect it in spite of the previous powerful odor of both male and female.

With one exception no female flew or moved about the cage after her wings were expanded until mating had taken place, nor did any female show the least sign of noticing the male or of preference

*See Wheeler, The Habits of Myrmecophila nebrascensis Bruner. Psyche, Oct., 1900. pp. 111-115; and Wasmann, Zur Lebensweise der Ameisengrillen (Myrmecophila). Natur u. Offenbarung. 47. Bd. 1901 pp. 129-152).